Example 2

The following ingredients were used to prepare clear, unpigmented polymer particles according to the process disclosed in Example 1. All amounts are by weight (grams).

Ingredient	Sample A	Sample B
methyl methacrylate	2342.40	2339.70
ethyl acrylate	324.00	324.00
EGDMA	18.90 (0.7%)	21.60 (0.8%)
lauryl mercaptan	12.61	12.61
Laurox ®	1.49	1.49
Aerosol ® OT	0.23	0.23
t-butyl peroxy acetate	0.10	0.10
Tinuvin ® P	0.27	0.27

After cooling to ambient temperature, the produced polymer was ground and sieved with a standard wirecloth sieve to the following sieve fractions:

>50	<60
>40	<50
>30	<40
<30	(Fines)

The sieve fractions were used to prepare a laboratory casting using the ingredients set forth below:

Ingredient	Sample A	Sample B
Syrup	56.25	59.85
n-butyl acrylate	1.85	1.74
EGDMA	0.23	0.23
lauryl mercaptan	0.10	0.10
t-butyl peroxy neodecanate	0.56	0.56
Vazo ® 64	0.023	0.023
Methyl methacrylate monomer	72.99	69.50
Particles	18.00	18.00
>40 <50 = 8.1		
>50 <60 = 6.3		
Fines = 3.6		

Vazo ® 64 is 2,2' azobis (2,4-dimethyl valeronitrile) available from DuPont.

The castings were cured in the manner disclosed in Example 1. The castings were then tested for their tensile properties at 185° C. using a biaxial tensile testing as disclosed in "Biaxial Stretching of Heat-Softened Plastic Sheets", L. R. Schmidt, PhD Thesis, University of Colorado (1972) (available from University Microfilms, Ann Arbor, Mich.)

	Sample A	Sample B
Conc. of Particles in Casting	12.0%	12.0%
Young's Modulus	189.3	222.0
Ultimate Strain	0.73	0.71
Ultimate Stress	66.10	72.90

Example 3

The following ingredients were used to prepare clear, unpigmented polymer in accordance with the procedure disclosed in Example 1.

Ingredient	Sample C	Sample D
methyl methacrylate	2399.16	2345.16
ethyl acrylate	270.00	324.00
EGDMA	16.2	16.2
lauryl mercaptan	12.61	12.61
Laurox ®	1.43	1.43
t-butyl peroxy acetate	0.10	0.10
Tinuvin ® P	0.27	0.27
Aerosol ® - OT	0.23	.023

After cooling to ambient temperature, the polymer was ground and sieved with a standard wirecloth sieve to the following sieve fractions:

>40	<50
>50	<60
<30	(Fines)

The sieved fractions were then used to prepare laboratory castings using the ingredients set forth below:

Ingredients	Sample C	Sample D
Syrup	52.47	55.17
n-butyl acrylate	1.96	1.88
methyl methacrylate monomer	76.98 (10%)	74.16 (12%)
lauryl mercaptan	0.065	0.065
Vazo ® 64	0.023	0.023
EGDMA	0.15	0.15
t-butyl peroxy neodecanoate	0.56	0.56
Particles	18.00	18.00
>40 <50 = 6.3		
>50 <60 = 8.1		
Fines = 3.6		

The castings were cured in the manner disclosed in Example 1. The castings were then tested for their tensile properties at 185° C. using a biaxial tensile testing.

	Sample C	Sample D
Conc. of Particles in Casting	12.0%	12.0%
Young's Modulus	217.20	215.70
Ultimate Strain	0.76	0.78
Ultimate Stress	72.7	77.0

Examples 2 and 3 demonstrate that the tensile properties of the acrylic composition according to the present invention can be altered and optimized by changing the concentration of crosslinker and/or the concentration of comonomer within the particles.

The present invention may be embodied in other specific forms without departing from the spirit and essential attributes thereof and accordingly, reference should be made to the appended claims, rather than to the foregoing specification, as indicating the scope of the invention.

We claim:

1. An acrylic composition comprising a matrix of polymethyl methacrylate having dispersed within it particles comprising 75 to 90 weight percent polymethyl methacrylate and greater than 10 to 25 weight percent of a comonomer comprising an ethylenically unsaturated monomer that copolymerizes with methylmethacrylate, wherein said particles comprise more than 0.4 weight percent of a crosslinker.

2. An acrylic composition as in claim 1, wherein said particles comprise greater than 10 to 20 weight percent of said comonomer.

3. An acrylic composition as in claim **1**, wherein said comononer is selected from the group consisting of ethyl acrylate, butyl acrylate, propyl acrylate, isopropyl acrylate, t-butyl acrylate, isobutyl acrylate, ethyl methacrylate, butyl metharcylate, propyl methacrylate, isopropyl methacrylate, t-butyl methacrylate and isobutyl methacrylate.

4. An acrylic composition as in claim **3**, wherein said comonomer is selected from the group consisting of butyl acrylate and ethyl acrylate.

5. An acrylic composition as in claim **1**, wherein said crosslinker is selected from the group consisting of allyl methacrylate, allyl acrylate, triallyl phosphate, diallyl maleate, methallyl acrylate, vinyl methacrylate, divinyl benzene, ethylene glycol dimethacrylate, diethylene glycol dimethacrylate, triethylene glycol dimethacrylate and mixtures thereof.

6. An acrylic composition as in claim **5**, wherein said crosslinker is ethylene glycol dimethacrylate.

7. An acrylic composition as in claim **1**, wherein said crosslinker is used in an amount of 0.5 to 1.5 weight percent.

8. An acrylic composition as in claim **7**, wherein said crosslinker is used in an amount of 0.6 to 1.0 weight percent.

9. An acrylic composition as in claim **1**, wherein said particles have a particle size of 250–600 microns.

10. A method for preparing an article comprising thermoforming a cured acrylic composition comprising a matrix of polymethyl methacrylate having dispersed within it particles comprising 75 to 90 weight percent polymethyl methacrylate and greater than 10 to 25 weight percent of a comononer comprising an ethylenically unsaturated monomer that copolymerizes with methyl methacrylate, wherein said particles comprise more than 0.4 weight percent of a crosslinker.

11. A method as in claim **10**, wherein said particles comprise greater than 10 to 20 weight percent of said comononer.

12. A method as in claim **10**, wherein said comonomer is selected from the group consisting of ethyl acrylate, butyl acrylate propyl acrylate, isopropyl acrylate, t-butyl acrylate, isobutyl acrylate, ethyl methacrylate, butyl metharcylate, propyl methacrylate, isopropyl methacrylate, t-butyl methacrylate and isobutyl methacrylate.

13. A method as in claim **12**, wherein said comononer is selected from the group consisting of butyl acrylate and ethyl acrylate.

14. A method as in claim **10**, wherein said crosslinker is selected from the group consisting of allyl methacrylate, allyl acrylate, triallyl phosphate, diallyl maleate, methallyl acrylate, vinyl methacrylate, divinyl benzene, ethylene glycol dimethacrylate, triethylene glycol dimethacrylate and mixtures thereof.

15. A method as in claim **10**, wherein said crosslinker is ethylene glycol dimethacrylate.

16. A method as in claim **10**, wherein said crosslinker is used in amount of 0.5 to 1.5 weight percent.

17. A method as in claim **16**, wherein said crosslinker is used in an amount of 0.6 to 1.0 weight percent.

18. A method as in claim **10**, wherein said particles have a particle size of 250 to 600 microns.

19. A thermoformed article prepared by the method of claim **10**.